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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/643,993	08/23/2000	Magnus Oberg	2466-69	3192

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EXAMINER	
TRAN, DZUNG D	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 02/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/643,993	OBERG ET AL.	
	Examiner	Art Unit	
	Dzung D Tran	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-28* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *12* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5-7 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehanna et al. U.S. patent no. 6,081,359 in view of Horuichi et al. U.S. patent no. 5,790,294 and further in view of Miyauchi et al. U.S. patent no. 5,877,881.

Takehana in figure 3 clearly disclose an optical WDM network having transmitting system and receiving system, ordinary transponders (figure 3, elements 2-1, 2-2, 2-3, 2-4), each ordinary transponder receiving the issue first optical signals from only one of the ordinary optical transmitters of the pair and converting the receive signals to issue the second optical signals of the well defined wavelength band (figure 3, elements $\lambda_1, \lambda_2, \lambda_3, \lambda_4$) a first optical multiplexer (figure 3, element 8) connected to receive the second optical signal issued by the ordinary transponders of the node, the first optical multiplexer combining the second optical signals to issue a combined optical signal on an optical fiber. Takehana differs from claims 1 and 28 of the present invention in that Takehana does not specific disclose an optical WDM network comprising at least two nodes interconnected by a bi-directional optical link, each node comprising at least two

pairs of ordinary optical transmitters and ordinary optical receivers, each pair including an ordinary optical transmitter and an ordinary optical receiver, and ordinary optical transmitter receiving electrical signals and converting the receive electrical signals to issue first optical signals and ordinary optical receiver receiving optical signals converting them to electrical signals. Horiuchi clearly discloses an optical WDM network comprising at least two nodes (figure 1, elements 1, 2) interconnected by a bi-directional optical link (figure 1, elements 7a, 7b, ..7n, 7n+1 and 8a, 8b, ..8n, 8n+1), each node comprising at least two pairs of ordinary optical transmitters (figure 4, elements 101, 102) and ordinary optical receivers (figure 5, elements CH1, CH2), each pair including an ordinary optical transmitter and an ordinary optical receiver. It would have been obvious to an artisan at the time of the invention was made to replace transmitting apparatus and receiving apparatus of Takehana with the transmitting equipment and receiving equipment of Horiuchi in order to obtain a reliability optical system.

Furthermore, Miyauchi discloses a transmitter included E/O converter (figure 1, element 16) for receiving electrical signals and converting the receive electrical signals to optical signals and a receiver included O/E converter for receiving optical signals converting them to electrical signals. Since E/O converter is well known in the art for converting electrical signals to optical signals and O/E converter is well known in the art for converting optical signals to electrical signals, it would have been obvious to an artisan at the time of the invention was made to include the E/O and O/E converters of

Miyauchi in optical WDM network of Takehana and Horiuchi in order to obtain a good transmission system and controlling system.

In considering claim 2, Takehana further discloses a spare transponder (figure 3, element 2-r) connected to the first optical multiplexer of the node to provide the third optical signals (figure 3, element λ_x) to the first optical multiplexer.

In considering claim 3, Takehana further discloses the first optical switches (figure 3, element 50) each first optical switch having an input and a first output and a second output, the input of first optical switch being connected to one of the ordinary optical transmitters and the first output being connected to that ordinary transponder, and the second output being connected to the spare transponder.

In considering claim 5, Takehana discloses optical power splitters (figure 3, element 50).

In considering claim 6, Takehana discloses a second optical multiplexer (figure 3, element 7) having an output connected to an input of the spare transponder (figure 3, elements 2-r), and having inputs connected to the ordinary optical transmitters (figure 3, elements 1-1, 1-2, 1-3, ...1-n).

In considering claim 7, Takehana discloses a second optical multiplexer (figure 3, element 7) having one output and a plurality of inputs, an output connected to an input of the spare transponder (figure 3, elements 2-r), the second optical switch being arranged to connect one of its inputs to its output in order to forward the first optical signals issued by one of the ordinary optical transmitters of the node to the spare transponder of the node.

3. Claims 8-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehanna et al. U.S. patent no. 6,081,359 in view of Horuichi et al. U.S. patent no. 5,790,294 and Miyauchi et al. U.S. patent no. 5,877,881 and further in view of Fisher U.S. patent no. 5,537,241.

In considering 8, 15 and 24, as per claims above, Takehanna, Horuichi and Miyauchi disclose al the limitations except for a pair of a spare transmitter device and a spare receiver device and a switch connected in such a way that if one of the ordinary transmitter of the node fails, an input signal of said one of the ordinary transmitter devices is connected through the switch to an input of the spare transmitter device. Fisher discloses a pair of a spare transmitter device (figure 1, elements TX1, TX2) and a spare receiver device (figure 1, elements RX1, RX2) and a switch (figure 1, element 12) connected in such a way that if one of the ordinary transmitter of the node fails, an input signal of said one of the ordinary transmitter devices is connected through the switch to an input of the spare transmitter device (column 2, lines 24-40). Since spare transmitter and spare receiver devices are well known in the art to use for backup and protection, it would have been obvious to an artisan at the time of the invention was made to include the spare transmitter device and spare receiver device of Fisher in the optical system of Takehanna, Horuichi and Miyauchi in order to improve the WDM transmission system for increasing reliability in the event of the failure of optical transmission system devices.

In considering claim 9, Takehana discloses the spare transmitter device of a pair of a spare transmitter device and a spare receiver device of a node comprises at least one spare transmitter and a spare transponder (figure 3, element 2-r) connected to the spare transmitter, the spare transponder being common to all spare transmitters of the node and connected to said all spare transmitters to convert received signals to issued third optical signals of the wavelength band (figure 3, element λ_r) in which the spare transmitter device and the spare receiver device of the pair are arranged to transmit and receive optical signals respectively.

In considering claim 10, Takehana further discloses a spare transponder (figure 3, element 2-r) is connected through a switch (figure 3, element 7) to all the ordinary optical in the node.

In considering claims 11 and 12, Takehana further discloses the ordinary receiver device of each pair of an ordinary transmitter device and an ordinary receiver device of a node comprises a demultiplexer (figure 3, element 14) and an ordinary optical receiver (16-1, 16-2, 16-n) connected to the demultiplexer, the demultiplexer being common to and connected to all the ordinary optical receiver devices in the node, and the spare receiver device of the pair of a spare transmitter device and a spare receiver device of the node comprises the demultiplexer (figure 3, element 42), the ordinary optical receivers comprised in all the ordinary receiver devices of the node and a switching device (figure 3, element 20), the switching device having outputs connected to the ordinary optical receivers to forward, at each instant, a signal from the demultiplexer to at most one of the ordinary optical receivers (claim 11) and the

switching device having an input connected to the demultiplexer receive optical signals from the demultiplexer and outputs connected to the spare optical receivers to forward, at each instant, a signal from the demultiplexer or filter to at most one of the ordinary spare optical receivers (claim 12).

In considering claim 13, Takehana further discloses a signal which is forwarded from the demultiplexer of a node to one of the spare optical receivers of the node is in the same wavelength band (column 6, lines 29-42), in which the spare transmitter device and the spare receiver device of a pair in the node are arranged to transmit and receive optical signals respectively.

In considering claim 14, Takehana further discloses a signal which is forwarded from the demultiplexer of a node to one of the spare optical receivers of is the node is in the same wavelength band (column 6, lines 29-42), as that of the ordinary transmitter device in the pair of an ordinary transmitter device and that ordinary receiver device which comprises an ordinary receiver with which the spare receiver is included in a pair.

In considering claim 16, Takehana further discloses the first optical switches (figure 3, element 50) each first optical switch being connected to an ordinary optical transmitter and a spare optical transmitter of a pair to forward optical signals from only one of the ordinary optical transmitter and the spare optical transmitter.

In considering claim 17, Takehana further discloses the first optical switch in a node is arranged to connect, in a first position, the ordinary optical transmitter to an ordinary transponder (figure 3, elements 2-1, 2-2, 2-3, 2-4), the ordinary transponder converting received optical signals to issued optical signals of a well defined wavelength

band (figure 3, elements $\lambda_1, \lambda_2, \lambda_3, \lambda_4$), the wavelength bands of different ordinary transponders in a node being separate from each other, the optical signals issued by the ordinary transponders of one node being provided to an optical multiplexes (figure 3, element 8) combining the optical signals to issue them on an optical fiber connected to another node, and to connect, in a second position of the first optical switch, an ordinary transmitter to a spare transponder (figure 3, elements 2-r), the spare transponder converting received optical signals to issued optical signals of a well defined wavelength band (figure 3, elements λ_r), the wavelength band of the spare transponder being separate from the wavelength bands of the ordinary transponders in the node, the optical signals issued by the spare transponder being provided to the optical multiplexer to be also issued on the optical fiber.

In considering claim 18, Takehana further discloses the first position of one of the first optical switches of a node the spare optical transmitter which is connected to said one of the first optical switches (figure 3, elements 50) is connected through said one of the first optical switches to the spare transponder (figure 3, elements 2-r), through a second switch (figure 3, element 7), the second switch allowing optical signals from at most one spare optical transmitter to reach the spare transponder.

In considering claim 19, Takehana further discloses the second position of one of the first optical switches (figure 3, elements 50) of a node the ordinary optical transmitter which is connected to said one of the first optical switched is connected through the first optical switch to the spare transponder (figure 3, elements 2-r) through

the second switch (figure 3, element 7), the second switch allowing optical signals from at most one ordinary optical transmitter to reach the spare transponder.

In considering claim 20, Takehana further discloses second position of one of the first optical switches (figure 3, elements 50) of a node the spare optical transmitter which is connected to said one of the first optical switches is connected to a respective ordinary transponder (figure 3, elements 2-1, 2-2, 2-3, 2-4).

In considering claim 21, Takehana further discloses each ordinary optical transmitter of a node is connected to an ordinary transponder (figure 3, elements 2-1, 2-2, 2-3, 2-4), one ordinary transponder being arranged for each ordinary optical transmitter, an ordinary transponder being arranged to convert received optical signals to issued optical signals of a well defined wavelength band (figure 3, elements $\lambda_1, \lambda_2, \lambda_3, \lambda_4$), the wavelength bands of different ordinary transponders in a node being separate from each other, the optical signals issued by the ordinary transponders of one node being provided to an optical multiplexer (figure 3, element 7) combining the signals to issue them on an optical fiber connected to another node, and the spare optical transmitters being connected to a spare transponder (figure 3, element 2-r), the spare transponder converting received optical signals to issued optical signals of a well defined wavelength band (figure 3, element λ_r), the wavelength band of the spare transponder being separate from the wavelength bands of the ordinary transponders in the node, the optical signals issued by the spare transponder being provided to the optical multiplexer. the connection of the spare optical transmitters to the spare

transponder being made in such a way that the spare transponder receives at most optical signals issued by at most one spare transmitter.

In considering claim 22, Takehana further discloses all ordinary receivers of a node are connected to a single demultiplexer (figure 3, element 14)

In considering claim 23, Takehana further discloses a switch (figure 3, element 20) being provided to conduct an optical signal from the demultiplexer to at most one of the ordinary receivers, this optical signal being in the same wavelength band as the optical signals issued by a spare transponder.

In considering claim 25, Takehana further discloses all ordinary receivers of a node are connected to a single demultiplexer (figure 3, element 14) and convert received optical signals to electrical signals, each spare receiver being connected to the demultiplexer (figure 3, element 14) through a switch (figure 3, element 42), the switch having a plurality of outputs, each output being connected to a different one of the spare optical receivers, and the switch being arranged to forward a signal from the demultiplexer to at most one of the spare optical receivers.

In considering claim 26, Takehana further discloses a signal which is forwarded from the demultiplexer to one of the spare optical receivers is in the same wavelength band (column 6, lines 29-42), as the optical signals issued by a spare transponder of the node.

In considering claim 27, Takehana further discloses a signal which is forwarded from the demultiplexer of a node to one of the spare optical receivers of the node is in the same wavelength band column 6, lines 29-42), as the optical signals issued by the

ordinary transmitter in the pair of an ordinary transmitter and that ordinary receiver, with which the spare receiver is included in a pair.

4. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Sutter et al. U.S. patent no. 5,760,934. Ring network for transmitting wavelength multiplexed informations

b. Mestdagh et al. U.S. patent no. 5,299,293. Protection arrangement for an optical transmitter/receiver device

c. Harano U.S. patent no. 5,943,146. Optical transmission system

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung Tran whose telephone number is (703) 305-0932.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Jason Chan, can be reached on (703) 305-4729.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Leslie Pascal

LESLIE PASCAL
PRIMARY EXAMINER